AMENDMENTS TO THE CLAIMS

Cancel claims 1-25.

26. (New) An imager, comprising:

a semiconductor substrate;

an array of photosensitive sites located on the substrate, the array including

a plurality of first photosensitive sites, wherein each first photosensitive site is configured to measure the level of a first spectral component in light received by the respective first photosensitive site, and

a plurality of second photosensitive sites;

a line decoder formed on the substrate and having at least one serial output for transferring out at least one line of measured spectral components from the array during a read out operation; and

an interpolator located in the substrate and configured to estimate the level of the first spectral component in the light received by at least one of the second photosensitive sites based on at least one measurement of the first spectral component obtained respectively by at least one of the first photosensitive sites in the at least one line transferred out during the read operation.

27. (New) The imager according to claim 26, wherein the first spectral component is a primary color of light.

28. (New) The imager according to claim 26, wherein

each second photosensitive site is configured to measure the level of a second spectral component in light received by the respective second photosensitive site, and

the interpolator is further configured to estimate the level of the second spectral component in the light received by at least one of the first photosensitive sites based on at least one measurement of the second spectral component obtained respectively by at least one of the second photosensitive sites in the at least one line transferred out during the read operation.

29. (New) The imager according to claim 28, wherein the first spectral component is a first primary color of light and the second spectral component is a second primary color of light.

30. (New) The imager according to claim 28, wherein

the array further comprises a plurality of third photosensitive sites, and

the interpolator is further configured to estimate the level of the first spectral component in the light received by at least one of the third photosensitive sites based on at least one measurement of the first spectral component obtained respectively by at least one of the first photosensitive sites in the at least one line transferred out during the read operation, and to estimate the level of the second spectral component in the light received by at least one of the third photosensitive sites based on at least one measurement of the second spectral component obtained respectively by at least one of the second photosensitive sites in the at least one line transferred out during the read operation.

31. (New) The imager according to claim 30, wherein

each third photosensitive site is configured to measure the level of a third spectral component in light received by the respective third photosensitive site, and

the interpolator is further configured to estimate the level of the third spectral component in the light received by at least one of the first photosensitive sites and/or at least one of the second photosensitive sites based on at least one measurement of the third spectral component obtained respectively by at least one of the third photosensitive sites in the at least one line transferred out during the read operation.

32. (New) The imager according to claim 31, wherein

the first spectral component is a first primary color of light,

the second spectral component is a second primary color of light, and

the third spectral component is a third primary color of light.

33. (New) The imager according to claim 31, further comprising an A/D conversion element located in the substrate and configured to receive the at least one line of measured spectral components read out from the line decoder and output the received measurements as digital values to the interpolator, and

wherein the interpolator estimates the first spectral component levels in the second and third photosensitive sites, the second spectral component levels in the first and third photosensitive sites, and the third spectral component level in the first and second photosensitive sites based on the digital values received from the A/D conversion element.

34. (New) The imager according to claim 26, further comprising an A/D conversion element located in the substrate and configured to receive the at least one

line of measured spectral components read out from the line decoder and output the received measurements as digital values to the interpolator, and

wherein the interpolator estimates the first spectral component levels in the second photosensitive sites based on the digital values received from the A/D conversion element.

35. (New) The imager according to claim 26, wherein the at least one serial output of the line decoder transfers out several sequential lines of measured spectral components from the array during each read out operation.

36. (New) The imager according to claim 26, wherein the at least one serial output of the line decoder transfers out a block of measured spectral components from the array during each read out operation.

37. (New) An imager, comprising:

a semiconductor substrate;

a plurality of first photosensitive sites located in the substrate, wherein each first photosensitive site is configured to measure the level of a first spectral component in light received by the respective first photosensitive site;

a plurality of second photosensitive sites located in the substrate; and

an interpolator located in the substrate and configured to receive digital data representing the spectral component levels measured in the photosensitivity sites, and to estimate the level of the first spectral component in the light received by at least one of the second photosensitive sites based on at least one digitized measurement of the first spectral component obtained respectively by at least one of the first photosensitive sites.

38. (New) The imager according to claim 37, wherein

each second photosensitive site is configured to measure the level of a second spectral component in light received by the respective second photosensitive site, and

the interpolator is further configured to estimate the level of the second spectral component in the light received by at least one of the first photosensitive sites based on at least one digitized measurement of the second spectral component obtained respectively by at least one of the second photosensitive sites.

39. (New) The imager according to claim 38, further comprising a plurality of third photosensitive sites, wherein each third photosensitive site is configured to measure the level of a third spectral component in light received by the respective third photosensitive site, and

wherein the interpolator is further configured to estimate

the level of the first spectral component in the light received by at least one of the third photosensitive sites based on at least one digitized measurement of the first spectral component obtained respectively by at least one of the first photosensitive sites,

the level of the second spectral component in the light received by at least one of the third photosensitive sites based on at least one digitized measurement of the second spectral component obtained respectively by at least one of the second photosensitive sites, and

the level of the third spectral component in the light received by at least one of the first photosensitive sites and/or at least one of the second photosensitive sites based on at least one digitized measurement of the third spectral component obtained respectively by at least one of the third photosensitive sites.

40. (New) The imager according to claim 39, wherein
the first spectral component is a first primary color of light,
the second spectral component is a second primary color of light, and
the third spectral component is a third primary color of light.

41. (New) The imager according to claim 40, wherein the interpolator output a twenty four bits of color data for each photosensitive site, with each color value being represented by eight bits.

42. (New) The imager according to claim 39, wherein the interpolator includes at least one serial register for storing digital bit values representing the spectral component measurements from a photosensitive site being interpolated and the photosensitive sites neighboring the photosensitive site being interpolated.

43. (New) The imager according to claim 42, wherein, for estimating a spectral component level for a photosensitive site, the interpolator digitally weights the values of the spectral component being estimated, as measured by the photosensitive sites providing the measurements and which are currently stored in the at least one serial register, based on the distances of the photosensitive sites providing the measurements from the photosensitive site for which the spectral component is being estimated.

44. (New) An imaging device, comprising:
a display for displaying an image on an array of M x N pixels; and
an imager which comprises
a substrate,

an M x N array of photosensitive sites located on the substrate, the array including

a plurality of first photosensitive sites located in the substrate, wherein each first photosensitive site is configured to measure the level of a first color component in light received by the respective first photosensitive site, and

a plurality of second photosensitive sites located in the substrate, wherein each second photosensitive site is configured to measure the level of a second color component in light received by the respective second photosensitive site; and

an interpolator located in the substrate and configured to receive digitized color component values corresponding to the measurements obtained in the first and second photosensitive sites, to estimate the level of the first color component in the light received by at least one of the second photosensitive sites based on at least one digitized color component value obtained respectively from at least one of the first photosensitive sites, and to estimate the level of the second color component in the light received by at least one of the first photosensitive sites based on at least one digitized color component value obtained respectively from at least one of the second photosensitive sites.

45. (New) The imaging device according to claim 44, wherein the interpolator estimates the color component level not measured in each respective photosensitive site in at least one line of photosensitive sites in the array during a readout operation.

46. (New) The imaging device according to claim 45, wherein the interpolator estimates the color component level not measured in each respective photosensitive site in several sequential lines of photosensitive sites in the array during a readout operation.

47. (New) The imaging device according to claim 45, wherein the interpolator estimates the color component level not measured in each respective photosensitive site in a block of photosensitive sites in the array during a readout operation.

48. (New) The imaging device according to claim 44, wherein the M x N array further includes a plurality of third photosensitive sites, wherein each third photosensitive site is configured to measure the level of a third color component in light received by the respective third photosensitive site, and

wherein the interpolator is further configured to estimate

the level of the first color component in the light received by at least one of the third photosensitive sites based on at least one digitized color component value obtained respectively from at least one of the first photosensitive sites,

the level of the second color component in the light received by at least one of the third photosensitive sites based on at least one digitized color component value obtained respectively from at least one of the second photosensitive sites, and

the level of the third color component in the light received by at least one of the first photosensitive sites and/or at least one of the second photosensitive sites based on at least one digitized color component value obtained respectively from at least one of the third photosensitive sites.

49. (New) The imaging device according to claim 48, wherein the interpolator estimates the color component level not measured in each respective photosensitive site in at least one line of photosensitive sites in the array during a readout operation.

50. (New) The imaging device according to claim 49, wherein the interpolator estimates the color component level not measured in each respective photosensitive site in several sequential lines of photosensitive sites in the array during a readout operation.

51. (New) The imaging device according to claim 50, wherein the interpolator estimates the color component level not measured in each respective photosensitive site in a block of photosensitive sites in the array during a readout operation.

52. (New) An imaging device, comprising:

a display for displaying an image on an array of M x N pixels; and

an imager which comprises

a substrate,

an M x N array of photosensitive sites located on the substrate, the array including

a plurality of first photosensitive sites located in the substrate, wherein each first photosensitive site is configured to measure the level of a first color component in light received by the respective first photosensitive site,

a plurality of second photosensitive sites located in the substrate, wherein each second photosensitive site is configured to measure the level of a second color component in light received by the respective second photosensitive site,

a plurality of third photosensitive sites, wherein each third photosensitive site is configured to measure the level of a third color component in light received by the respective third photosensitive site; and

an interpolator located in the substrate and configured to determine, for each of the M x N photosensitive sites, digitized color component values for the color components not measured in the respective photosensitive site, and to output digitized color component values for the first, second and third color components for each of the M x N photosensitive sites.

53. (New) The imaging device according to claim 52, wherein the interpolator outputs the color component values for each photosensitive site as 8 bits of data for each color component.

54. (New) The imaging device according to claim 52, wherein the interpolator determines the color component values not measured and outputs the color component values for the first, second and third color components for each photosensitive site in at least one line of photosensitive sites in the array during a readout operation.

55. (New) The imaging device according to claim 54, wherein the interpolator determines the color component values not measured and outputs the color component values for the first, second and third color components for each photosensitive site in several sequential lines of photosensitive sites in the array during a readout operation.

56. (New) The imaging device according to claim 54, wherein the interpolator determines the color component values not measured and outputs the color component values for the first, second and third color components for each photosensitive site in block of photosensitive sites in the array during a readout operation.